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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|----------------------------------|
| 10/020,218 | 12/18/2001 | Alper Tunga Erdogan | 56162.000359 | 5736 |
| 7590 | 12/08/2005 | | | EXAMINER WILLIAMS, LAWRENCE B |
| Kevin T. Duncan, Esq. Hunton & Williams Intellectual Property Department 1900 K Street, N.W., Suite 1200 Washington, DC 20006 | | | ART UNIT 2638 | PAPER NUMBER |

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|------------------------------|------------------------|---------------------|--|
| | 10/020,218 | ERDOGAN ET AL. | |
| | Examiner | Art Unit | |
| | Lawrence B. Williams | 2634 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 18 December 2001.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-3, 6-14, 17-22 is/are rejected.

7) Claim(s) 4,5,15 and 16 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 18 December 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 6-7, 12-14, 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (US Patent 6,754,261 B1).

(1) With regard to claim 1, Liu et al. discloses in Fig. 9, a method for implementing a fast adaptive algorithm for obtaining finite impulse response filter coefficients for a time domain equalizer filter (TEQ filter), the method comprising the steps of: adaptively computing at least one equalization delay parameter (Delay); and adaptively computing at least one time domain equalizer filter coefficient based on the equalization delay parameter (col. 8, lines 23-65; col. 9, lines 20-40).

(2) With regard to claim 2, Liu et al. also discloses wherein an overall channel impulse response length is shortened within a given target length (col. 8, lines 39-42).

(3) With regard to claim 6, Liu et al. also discloses wherein the step of adaptively computing the time domain equalizer filter coefficient further comprises the step of: minimizing mean square error criterion (col. 8, lines 56-59).

(4) With regard to claim 7, Liu et al. also discloses wherein the step of adaptively computing the equalization delay parameter further comprises the step of: implementing one or more of training sequences and received sequences (col. 8, lines 43-45).

(5) With regard to claim 8, Liu et al. also discloses wherein the training sequences comprise consecutive samples of a received signal (col. 7, lines 5-13).

(6) With regard to claim 9, Liu et al. also discloses wherein the time domain equalizer filter is a sample spaced finite impulse response filter (col. 8, lines 65-67). Liu et al. discloses taps, which is synonymous to sample space in the filter.

(7) With regard to claim 12, Liu et al. discloses in Fig. 9, a system for implementing a fast adaptive algorithm for obtaining finite impulse response filter coefficients for a time domain equalizer filter, the system comprising: a delay module (Delay) for adaptively computing at least one equalization delay parameter; and an equalizer module (TEQ filter) for adaptively computing at least one time domain equalizer filter coefficient based on the equalization delay parameter.

(8) With regard to claim 13, Liu et al. also discloses wherein an overall channel impulse response length is shortened within a given target length (col. 8, lines 39-42; col. 9, lines 20-40).

(9) With regard to claim 14, Liu et al. discloses the use of the MSE, which would inherently includes some means for its computation (col. 8, lines 56-59).

(10) With regard to claim 17, Liu et al. discloses minimizing mean square error criterion (col. 8, lines 56-58), which would inherently include some apparatus or module for its computation.

(11) With regard to claim 18, Liu et al. also discloses implementing one or more of training sequences and received sequences (col. 8, lines 43-45), which would inherently include an implementing module or apparatus.

(12) With regard to claim 19, Liu et al. also discloses also discloses wherein the training sequences comprise consecutive samples of a received signal (col. 7, lines 5-13).

(13) With regard to claim 20, Liu et al. also discloses wherein the time domain equalizer filter is a sample spaced finite impulse response filter (col. 8, lines 65-67). Liu et al. discloses taps, which is synonymous to sample space in the filter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US Patent 6,754,261 B1) as applied to claims 1 and 12 above, and further in view of Gatherer (5,461,640).

(1) With regard to claim 3, claim 3 inherits all limitations of claim 1 above. As noted above, Liu et al. discloses all limitations of claim 1 above. Liu et al. does not however disclose

wherein the step of adaptively computing the equalization delay parameter further comprises the step of: computing an estimate cross-correlation function.

However, Gatherer discloses a step of adaptively computing the equalization delay parameter further comprises the step of: computing an estimate cross-correlation function (col. 6, lines 8-17).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Gatherer with the invention of Liu et al. as a computationally less complex method of equalizing a signal transmitted through a distorted channel.

(2) With regard to claim 14, Gatherer et al. also discloses in Fig. 3, wherein the delay module further comprises: a cross-correlation module (21c) for computing an estimate cross-correlation function (col. 6, lines 8-17; col. 8, lines 4-6).

6. Claims 9, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US Patent 6,754,261 B1) as applied to claims 1, 12 above, and further in view of Trans et al. (US 2003/0016770 A1).

(1) With regard to claim 9, as noted above, claim 9 inherits all limitations of claim 1 above. As noted above, Liu et al. discloses all limitations of claim 1. Liu et al. does not however disclose wherein the time domain equalizer filter is a fractionally spaced finite impulse response filter.

However, Trans et al. discloses in Fig. 29, a channel equalization stem and method wherein he incorporates the use of a fractionally spaced finite impulse response filter.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Trans et al. with the invention of Liu et al. as a method of equalizing precursor ISI (paragraph [0227]).

(2) With regard to claim 21, claim 21 discloses limitations similar to those disclosed in claim 9, therefore a similar rejection applies.

7. Claims 10, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US Patent 6,754,261 B1) as applied to claims 1, 12 above, and further in view of Trans et al. (US 2003/0016770 A1).

(1) With regard to claim 10, as noted above, Liu et al. discloses all limitations of claim 1. Liu et al. does not however disclose wherein the time domain equalizer filter minimizes one or more of energy inter symbol interference and inter channel interference.

However, Trans et al. discloses in wherein the time domain equalizer filter minimizes one or more of energy inter symbol interference and inter channel interference (paragraph [0227]).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Trans et al. with the invention of Liu et al. as a method of insuring the accurate receipt of the transmitted signals.

(2) With regard to claim 20, claim 20 discloses limitations similar to those disclosed in claim 10. Therefore a similar rejection applies.

Allowable Subject Matter

8. Claims 4, 5 and 15, 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Everitt discloses in US Patent 6,061,396 Method and Apparatus For Modified Baud Rate Sampling.

b.) Davis et al. Discloses in US Patent 4,899,366 Tap Rotation In Fractionally Spaced Equalizer To Compensate For Drift Due To Fixed Sample Rate.

c.) Farhang-Boroujeny et al. discloses in US Patent 6,853,626 B1 Method And Apparatus For Echo Cancellation In An Asymmetric Communication System.

d.) Erving et al. discloses in US 2002/0154716 A1 Efficient Reduced Complexity Windowed Optimal Time Domain Equalizer For Discrete Multitone-Based DSL Modem.

e.) Rafie et al. discloses in US Patent 6,628,707 B1 Adaptive Equalizer system For Short Burst Modems And Link Hopping Radio Networks.

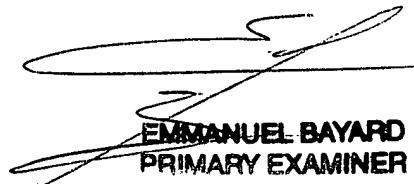
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
December 2, 2005



EMMANUEL BAYARD
PRIMARY EXAMINER